Weekly Report

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1 Project

This week, I asked Tianye to investigate the open-source parallel rendering framework **Equalizer**. Several demos were successfully employed on two machines (http://www.equalizergraphics.com/). The primary results show that we can use this framework as a basis for our parallel visualization engine.
On the other side, Biao and I had a discussion on the parallel system for extraction of iso-line, iso-surface, streamline, and so on. At first, we though that Hadoop can be used. However, Hadoop can not work for iterative tasks like generating streamlines. Thus, we decided to implement this system with MPI by ourselves.
I also distributed the framework based on WebGL for browser application to Haonan and Xin. And they will implement a basic version in this summer including the rendering of Earth and the streamline rendering through the browser.

2 Research

This week, I tried our uncertainty-aware projection method on two datasets: the U.S. Crime Rate (UCR) dataset and the NBA players' stats dataset.

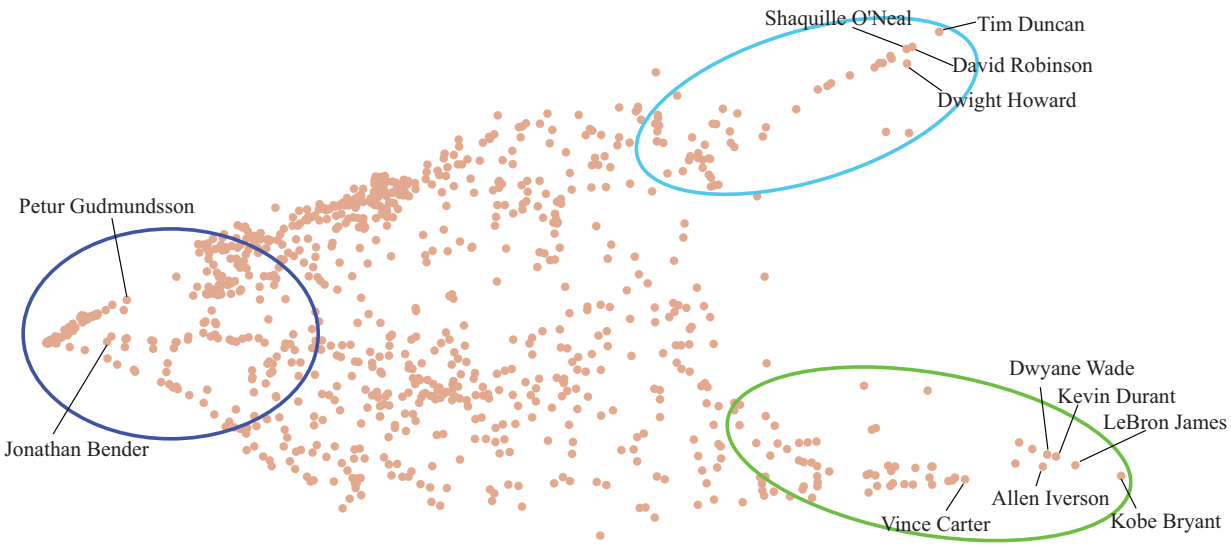

Figure 1: The result of our uncertainty-aware projection for NBA players' stats dataset

The UCR dataset was collected from the FBI website. The result of this dataset showed no significance of our method. Because, the 2D projection was quite continuous which gave rise to difficult interpretation. Thus, I asked Honghui to write a spider program to download the NBA players' statistics dataset

(http://www.basketball-reference.com/players/) since year 1981. Generally, we treated each player as an ensemble and the statistics (including Field Goal, Field Goal Attempts, 3 Points, 3 Points Attempts, Steal, and so on.) of a year as an ensemble member. Figure 1 shows the result of our method on this dataset.
From the result in Figure 1, we can see a triangle-like patten of this dataset. For demonstration, I labeled several players (or ensembles) with their names. Roughly speaking, the points in the right part correspond to excellent players such as Kobe Bryant, LeBron James, and so on. The the left part represents the role players. Further more, we found that the region indicated by the cyan ellipse represents players of **Center**. And the region indicated by the green ellipse represents players of **Small Forward** and **Point Guard**. The outliers in the right part also correspond to super-stars which can be verified by the tagged names.
Figure 2 lists the detailed statistics for several representative players by continuous parallel coordinates. From the result, we can see that the statics of **LeBron James** and **Kevin Durant** are more similar that that of **Kobe Brant**. We also can find that the statics of **LeBron James** are more concentrated than that of **Kobe Brant**. This demonstrates that **Kobe Brant** is much hard-working guy. He gets his achievements progressively which is quite different from that of gifted players like **LeBron James** and **Kevin Durant**. Furthermore, we can easily distinguish players of Center and players of Small Forward or Point Guard. They show completely different distributions of career statistics. Typically, role players have short career life and low statistics. This can be verified in bottomest result in Figure 2.

3 Work to do in next week

- Finish download the pictures and other personal profiles for all players such that a complete interactive system can be obtained.
- Find the difference of our method and the traditional MDS on the NBA player dataset.
- Revise paper.

References

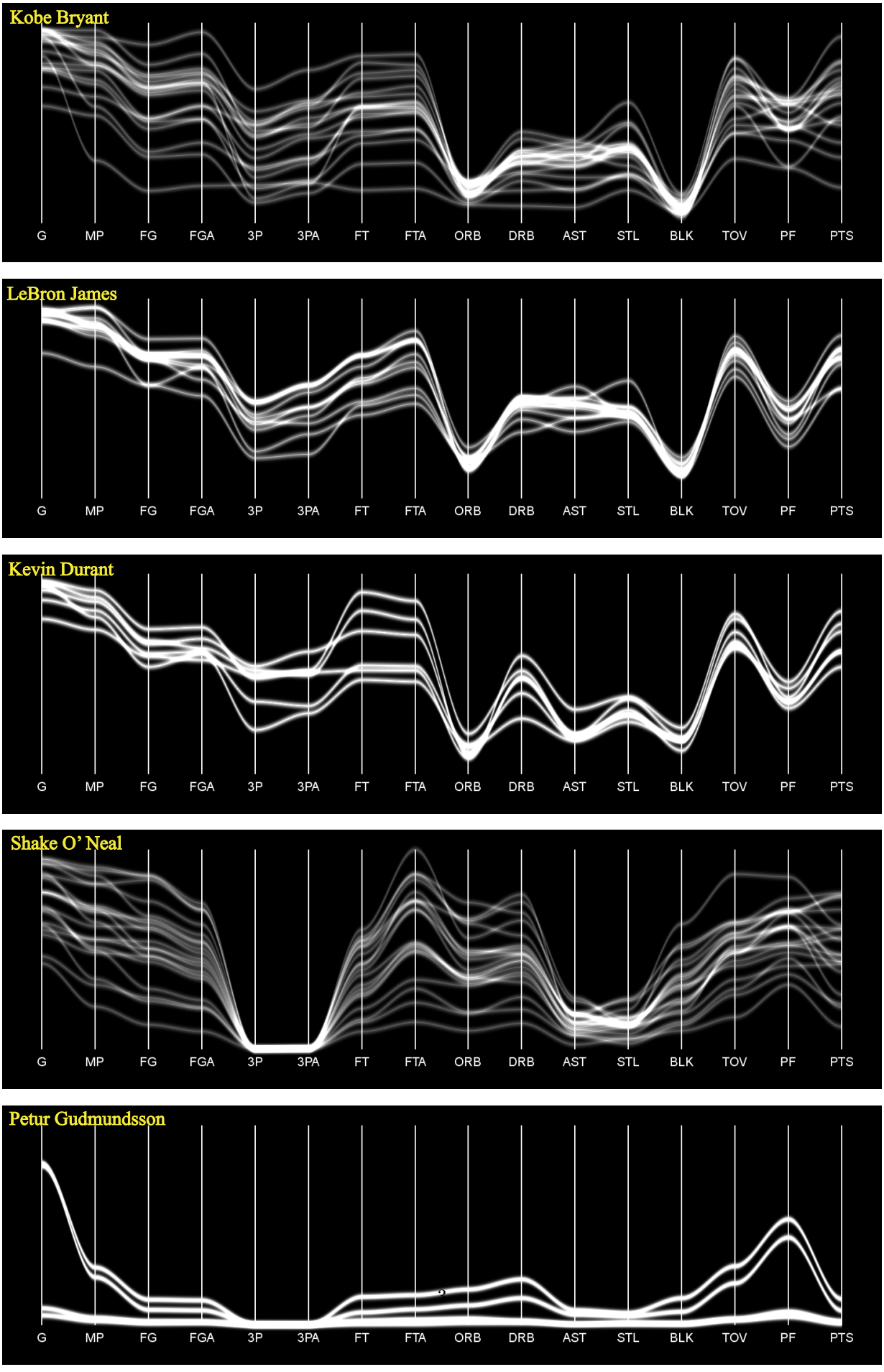

Figure 2: The detailed statistics for several players